

Having described the invention, the following is claimed:

1. A vapor decontamination system for decontaminating a defined region, said system comprising:
 - a chamber defining a region;
 - a first generator for generating vaporized hydrogen peroxide from a solution of hydrogen peroxide and water and introducing vaporized hydrogen peroxide into a carrier gas;
 - a device for introducing ozone into said carrier gas;
 - a closed loop circulating system for supplying said vaporized hydrogen peroxide and said carrier gas to said region; and
 - a destroyer for breaking down said vaporized hydrogen peroxide.
2. A vapor decontamination system as defined in claim 1, wherein said carrier gas comprises oxygen and said second generator generates ozone from said oxygen.
3. A vapor decontamination system as defined in claim 1, wherein a sensor is operable to detect the concentration of ozone in said carrier gas.
4. A vapor decontamination system as defined in claim 1, wherein said first generator is a vaporizer.
5. A vapor decontamination system as defined in claim 1, further comprising:
 - a destroyer for breaking down said ozone.
6. A vapor decontamination system as defined in claim 1, further comprising:
 - a blower within said closed loop circulating system, said blower operable to circulate air through said closed loop circulating system;
 - a dryer disposed within said closed loop circulating system between said destroyer and said generator, said dryer operable to remove moisture from said circulating system; and

a heater within said closed loop circulating system upstream from said first generator for heating air flowing through said circulating system.

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7. In a decontamination system for decontaminating a region, said system having a first generator for generating vaporized hydrogen peroxide, a second generator for generating ozone, a closed loop system for supplying the vaporized hydrogen peroxide and the ozone to said region and a destroyer for breaking down the vaporized hydrogen peroxide, a sensor for detecting the concentration of ozone in said system, and a controller for determining the presence of ozone in said region based upon data from said sensor.

8. A decontamination system as defined in claim 7, wherein said controller is operable to determine the concentration of ozone in said region.

9. A decontamination system as defined in claim 8, wherein said sensor is an ozone sensor.

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10. A method of sterilizing with a combination of ozone and vaporized hydrogen peroxide (VHP) in a region, comprising the steps of:

providing a sealable region having an inlet port and an outlet port, and a closed loop conduit having a first end fluidly connected to the region inlet port and a second end fluidly connected to the region outlet port;

re-circulating a flow of a carrier gas into, through and out of said region and around the closed loop conduit;

delivering vaporized hydrogen peroxide into the re-circulating carrier gas flow upstream of the region inlet port;

delivering ozone into the re-circulating carrier gas flow upstream of the region inlet port;

destroying the vaporized hydrogen peroxide at a first location downstream from the region outlet port; and

determining a presence of ozone in said region based upon the readings derived from an ozone sensor.

11. A method as defined in claim 10, wherein said carrier gas is air.

12. A method as defined in claim 10, wherein said delivering ozone includes the electrical generation of ozone from said carrier gas.

13. A closed loop, flow through method of vapor phase decontamination in a sealable chamber or region having an inlet port and an outlet port, and a closed loop conduit fluidly connecting the outlet port to the inlet port, the method comprising the steps of:

re-circulating a flow of a carrier gas into, through and out of the chamber, and through the closed loop conduit;

supplying vaporized hydrogen peroxide into the re-circulating carrier gas flow;

supplying ozone into the re-circulating carrier gas flow;

destroying the vaporized hydrogen peroxide to form water and oxygen at a first location downstream from said outlet port; and

monitoring the concentration of ozone within the carrier gas.

14. A closed loop, flow through method as defined in claim 13, wherein said carrier gas is air.

15. A closed loop, flow through method as defined in claim 13, wherein said destroying step includes catalytically decomposing the hydrogen peroxide vapor into water and oxygen.

16. A closed loop, flow through vapor phase decontamination system, comprising:

a sealable chamber having an inlet port and an outlet port;

a closed loop conduit system having a first end fluidly connected to said inlet port and a second end fluidly connected to said outlet port;

a blower connected to said conduit system for re-circulating a carrier gas flow into, through and out of the chamber;

a vaporizer for delivering vaporized hydrogen peroxide into said carrier gas flow upstream of said inlet port;

a generator for delivering ozone into said carrier gas flow upstream of said inlet port;

a destroyer downstream of said outlet port for converting the vaporized hydrogen peroxide in water and oxygen; and

a sensor for detecting ozone.